

### Goal

The program conducts oceanographic research so as to provide scientific and technical advice to other researchers, government and industry. Jointly, the areas of physical and biological oceanography “contain” the marine environment through outcomes that describe the transport and dispersal of sediments, heat, pathogens, pollutants, nutrients and marine biota. At the most fundamental level, these factors can influence and control the fundamental ecosystems involving viruses, bacteria, phytoplankton and zooplankton that support and under-pin the function of marine ecosystems and ultimately fish stocks and fisheries sustainability.

Individuals within the Program work closely together in the collection of data, its analysis and in the development of super-computer models of ocean currents, surface waves, larval dispersal and phytoplankton growth.

### A Hydrodynamic/Biogeochemical Facility

Following world’s best practise, we are developing this facility for Australia’s southern shelves and gulfs that will enable us to quantify the link between ocean circulation and the space-time dynamics of the plankton ecosystem for shelf and gulf systems. In addition, the facility will allow for the prediction of the transport of sediments and the dispersal of, prawn and lobster larval, viruses and pollutants.

### The Southern Australian Integrated Marine Observing System (SAIMOS)

In collaboration with Flinders University, shelf data streams for the facility are being collected by the Oceanography Program through implementation of the \$9M Southern Australian Integrated Marine Observing System (SAIMOS). This observing system is made up of shelf moorings, ship-based surveys, ocean gliders, and HF Ocean RADAR. The observing equipment is being deployed in the region of Kangaroo Island and Eyre Peninsula where significant upwelling of nutrients occurs. These nutrients provide food for the phyto/zooplankton ecosystems that underpin the fisheries and marine life of the region and gulfs.

### The Physical Oceanography Subprogram

Undertakes research into the dynamics and nature of ocean circulation off SA using analytic, numerical methods and data analyses. The physical environment contains the biological and a proper understanding of it is necessary first step in understanding the planktonic response to the summertime upwelling that characterises the region.

### The Biological Oceanography Subprogram

The Biological Oceanography subprogram conducts research into the dynamics and ecology of plankton and planktonic ecosystems across scales from nanometres to kilometres. Particular focus is given to the ecological processes of nutrient cycling, under natural and

anthropogenic conditions, which underpin the form and functioning of marine systems. In collaboration with Fisheries, the subprogram also conducts research into larval species such as prawns, blue crabs and lobster.

### The Marine Field Services Subprogram

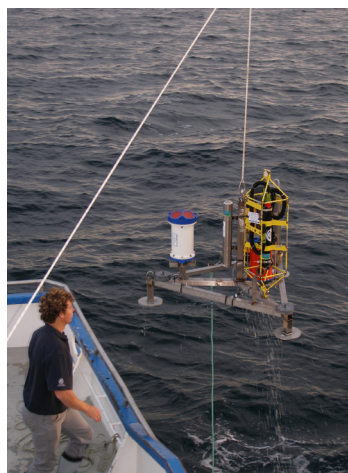
Has a nationally recognised capability in the deployment and maintenance of ocean moorings and Slocum gliders as well as in the measurement of nutrients, plankton abundance and species and primary productivity.

### The Ocean Modelling Subprogram

Continues to develop the large scale SA Regional Ocean model (Thevenard – Portland) which has been validated against the extensive SAIMOS data streams. High resolution sub-models of Spencer Gulf have been developed and used for prawn larval dispersal studies as well as the carrying capacity of aquaculture. These models are supplemented by models for surface waves (SWAN) and models for Nitrogen Phytoplankton, Zooplankton and Detritus (NPZD).

The Oceanography Program Leader is A/Prof John Middleton and the team includes Drs Mark Doubell, Charles James, John Luick, Paul van Ruth, Sophie Leterme, Prof Laurent Seuront, Paul Malthouse, Leeyng Wu, Shaun Byrnes, Louise Renfrey, Laura Richardson and emeritus A/Professor John Bye.

The Program has strong links with Flinders University, School of Biological Sciences.



Recovery of a mooring from the seafloor in Spencer Gulf using the SARDI research vessel RV Ngerin

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